2013 Annual Summary

The year of 2013 ended up being a dry one for the Inland Northwest. The lack of snow was especially impressive in the lee of the Cascades around Wenatchee, Leavenworth, and Winthrop. The Wenatchee Waterplant only received 1.3 inches setting a record for the lowest yearly snow. Records were also set at Winthrop and Stehekin with 19.2 and 36.1 inches respectively. Leavenworth came in with the second lowest snow year with 18.8 inches.

January started off with a decent snow storm on the 6th-7th. For some locations, this was the biggest storm of the season. Spokane Airport officially measured 6.9" of snow, and Grand Coulee picked up 4.6". But after this storm, the weather pattern markedly changed. High pressure became firmly established over the western US. Usually this would mean widespread fog and low clouds for our area. But very dry air moved into the area with this high pressure. As a result, skies stayed sunny during the day, which was nice. But the clear skies at night coupled with fresh snow on the ground created the coldest period of the winter. Nighttime temperatures in the teens and single digits were common for the middle of the month, with daytime temperatures in the 20s. Some outlying areas saw below-zero readings. Winthrop, Chewelah, and Wellpinit all reached -6°F on the morning of the 13th. A few weak weather systems were able to move through the region bringing generally light amounts of snow. One storm on the 11th slipped in from the south and brought 13.5" of snow to Winchester, ID. Another couple of storms came from the northwest during the 12th-14th. Kamiah, ID received 2" while Kellogg picked up 3.5" over two days. The high pressure eased toward the latter half of the month. Temperatures warmed back to normal values for late January, with snow changing to rain on the 25th and 26th bringing some much needed moisture. A push of warm air brought mild temperatures to some locations at the end of the month. Lewiston and Moses Lake both reached 55F on the 30th.

February continued the pattern of high pressure with infrequent storms. The first half of the month was largely dry. A weak storm on the 8th brought some rain and mountain snow to the Panhandle. Another weak system produced a widespread inch of snow for many locations on the 19th. The strongest system of the month moved through on the 22nd. While only producing modest amounts of rain and snow, it was one of the windier storms. Winds gusted to 48 mph near Genesee, ID and Pomeroy, WA, as well as 41 mph at Pullman/Moscow airport. A rainstorm on the last day of the month kept locations such as Wenatchee and Winthrop from having their driest February ever. By the end of

February, most of the Inland Northwest was near-normal for the winter precipitation, with the Wenatchee and Moses Lake area showing the largest deficit.

March was the typical rollercoaster of temperatures. The month started off rather balmy, with temperatures in the 50s and 60s for the first couple of days. Wenatchee airport tied a record high for the 1st with a reading of 63 degrees. But then temperatures quickly sank back into the upper 30s and 40s. Light snow on the morning of the 6th fell in the Cascade and northern valleys with amounts generally less than 1". More snow fell on the 7th with 3" at Republic and 2.9" at Conconully. Temperatures rebounded into the upper 50s and 60s by the middle of the month. Pomeroy Washington reached 67 degrees on the 13th. A cold front on the 14th and 15th brought gusty winds to the area while the mountains picked up more snow. Lookout Pass received 8-12" of snow while Winchester, ID picked up 3.5". The strongest weather system moved through the area on the evening of the 19th and 20th. Heavy snow fell in the Cascades with 5.8" of snow in Waterville and 4.5" near Leavenworth and Mazama. During the afternoon of the 20th the cold front pushed through the area bringing thunderstorms and gusty winds. There was a thunderstorm with a wind gust to 73 mph on the Camas Prairie while Lewiston gusted to 52 mph. In the early afternoon a line of thunderstorms moved through the Post Falls area. Strong winds from these storms knocked down 20 to 30 trees, some of which fell on a house.

April also started off mild, with many locations reaching their first 70 degree reading of the spring. Omak tied a record high for the day at 76 degrees. Spokane Airport touched 70 degrees on the 1st, the earliest 70 degree day since 2004. Temperatures quickly dropped back into the 50s as rain and mountain snow moved into the area. Several sites in north-central Washington set rainfall records on the 7th, including Omak with 0.72", Winthrop 0.46" and Chelan 0.45". By the middle of the month temperatures dropped even more as snow levels fell to the valley floors. Light dustings of snow accumulated as low as 2000' in the northern mountains. Hard-freeze temperatures were observed at a number of locations on the morning of the 17th, including 17 degrees at Priest Lake, 18 at Wilbur and Nez Perce, and 19 at Deer Park and Republic. The month saw a number of strong fronts bringing gusty winds, including the 13th where winds gusted to 54 mph near Mattawa and 49 mph at Uniontown. An even stronger front on the 29th brought wind gusts of 62 mph to Odessa and 56 mph to Vantage, as well as knocking out the power to many residents in northeast Washington. April 2013 turned out to be the windiest month since February 1999.

May turned out to be a backwards month, temperature-wise. While the 1st day of the month was colder than normal, temperatures quickly warmed into the 80s and low 90s by the 7th, and remained there for nearly a week. These readings were 15-20 degrees above normal for early May. A number of daily records were set, but few were shattered. Priest Rapids Dam hit 98F on the 10th, beating their old record of 93. Wenatchee recorded a high of 92 on that same day, beating its old record of 89. Temperatures quickly crashed back down to near normal valleys on the 13th as a strong front brought widespread rain to the area. Heavy rain and thunderstorms moved through the area on the 21st and 22nd. Wenatchee picked up 1.20" of rain over this period, which is nearly double their average for the entire month of May. The mountains of north Idaho and northeast Washington received 2 to 3 inches of rain in 24 hours. By the 23rd, the 80s and 90s were a distant memory as many locations were setting record cold afternoon high temperatures. Several sites stayed in the 40s including Grand Coulee (48F), Sandpoint (41F), and Plummer (46F). Bonners Ferry only reached 38 degrees with light snow at Moyie Springs. Winchester, Idaho picked up 3.2" of snow. Temperatures remained in below normal for the rest of the month with frequent showers.

This was a summer that couldn't quite make up its mind. June was mild but wet, July was hot and bone-dry, and then August turned mild and wet again. So overall, was it a hot summer? The average temperature over the 3 month period was certainly above normal.

Spokane 69.4 (tied for 11th all-time)

Lewiston 74.4 (tied for 9th all-time)

Wenatchee 74.0 (tied for 10th all-time)

But in large part, this was due to warm minimum temperatures, more so than maximum temperatures. If we look at just the average of high temperatures, we get:

Spokane 82.0 (tied for 28th all-time)

Lewiston 89.4 (17th all-time)

Wenatchee 86.2 (tied for 26th all-time)

So, just looking at high temperatures the summer was still warmer than normal, just not quite as extreme. Another way to look at the summer is our old favorite, the number of 90 degree or better days.

Spokane 23 (average 17)

Lewiston 56 (average 39)

Wenatchee 39 (average 32)

The first half of **June** 2013 was rather quiet. Temperatures were near normal with breezy days. A cold front brought heavy rain and much cooler weather to the region on the 18th. Ephrata set a record with 0.63" of rain, while Kellogg had 1.00". On the 19th, Pullman only reached a high of 52 degrees, a record for the day, while Bonners Ferry picked up 1.84" of rain and Lewiston had 1" of rain, both of which were records. Things didn't improve much the next day. A number of locations set records for cold high temperatures, including Wilbur and Potlatch with 50 degrees and Bayview at 49 degrees. The high of 50 in Spokane was the coldest day ever so late. After this, temperatures gradually warmed for the rest of the month. Omak had 0.96" of rain on the 24th, a record for the day. The month then ended on a rather unusual note. Typically after a rainstorm we'll have some drier air move in. Not the case this time. As a result, conditions became rather humid (by Inland Northwest standards) as the temperatures warmed into the 90s by the 30th.

Summer temperatures actually arrived a few days early this year. We often say that summer doesn't start until the 4th of **July**, but this year temperatures had their hottest readings of the summer on the 1st of July. That, coupled with the humidity, made for a few uncomfortable days. Our office issued heat advisories for this unusual combination. The high humidity also kept our nighttime lows very mild, compounding the heat affects. A number of records were broken on the 1st, including a high of 107 at both Lewiston and Moses Lake, along with 105F at Ephrata and Lacrosse. The heat and humidity also brought wet thunderstorms. A few of these storms caused flash flooding to the western suburbs of Wenatchee, which were possibly exacerbated by the burn scars of 2012. After this event, the weather took a marked turn to dry and breezy. And we're talking really dry. Humidity values dropped into the single digits on a daily basis. This, coupled with the winds, prompted the issuance of a number of Red Flag warnings for the Cascade areas. Thunderstorms on the 16th and 17th brought hail to the area, including

golf ball-sized hail near Wilbur and 1" hail on the Waterville Plateau. The accompanying lightning ignited some wildfires as well. For the month of July, many locations received barely a trace of rainfall.

But once again, the weather pattern changed. And if July was one of the driest months ever, August was just the opposite. The humid conditions of late June returned on a number of events. The Wenatchee airport measured 1.91 inches of rain, making it the 2nd wettest August since it opened in 1959. Over half of this fell on the first day of the month when 1.09" fell in one hour, resulting in urban flooding in the area. As the storm moved over the region on the 2nd, Spokane had a high of only 61 degrees with over a half inch of rain. Three days later, more heavy rain caused water, mud, rocks, and tree limbs to flow down Number 1 Canyon outside of Wenatchee. Another round of heavy rain and mudslides struck between the 9th and 11th. Number 2 Canyon road was closed due to a debris flow. A storm on the 11th developed over the Colockum-Tarpiscan burn area and caused a large flash flood and debris flow. One family had to escape their house through a window and sought safety by climbing a tree. By the end of the month, nocturnal thunderstorm events were becoming almost commonplace. A line of thunderstorms on the evening of the 25th brought widespread damaging winds to the region. Gusts up to 65 mph were measured west of Spokane. Numerous trees and power lines were downed, with the most extensive damage occurring in Stevens County. One person died in Pend Oreille County when a tree fell on a tent. On the 29th, a strong thunderstorm brought damaging winds to Okanogan.

The somewhat strange weather from this past summer seemed to perpetuate into autumn. Our driest month turned out to be rather wet, while our wettest month was on the dry side. And in between, it was just down right dry.

September started off with very active weather, unusual for that time of year. Thunderstorms rumbled through the area on the third, bringing golfball-sized hail south of Pomeroy, Washington. More storms on the 4th blew down trees in Endicott, Washington. Heavy rain storms on the 5th brought over an inch to the Cascade mountains. Significant flash flooding occurred outside of Wenatchee closing roads, cutting off some campers, and damaging homes with debris flows. 2.25" of rain fell near Twisp. Two people were injured near Entiat when a tree fell on their home. Temperatures after this warmed up to 10-15 degrees above normal. Lewiston touched 99 degrees on the 11th and 14th. A number of locations set record high temperatures on the 14th.

Another round of thunderstorms on the 15th brought dense blowing dust to the Othello and Warden area of central Washington, reducing visibility to 50 feet at times. The NWS office west of Spokane measured a gust of 60 mph. Numerous trees were blown down and some buildings were damaged. Six power poles were snapped off near Soap Lake with widespread power outages in central Washington. After this big event, the weather calmed down a bit, with cooler temperatures and occasional showers; still, not the usual September weather. The month ended on an especially wet note. Remnants of a west Pacific typhoon brought heavy rain to the area. Some sites in north Idaho recorded over 4" in 24 hours.

After a wet and wild September, the weather took quite a turn in **October**. High pressure dominated the Northwest. Sunny days and cool night were the theme. A cold front on the 8th of the month provided most of the rain that the region received for the entire month. Another front on the 27th brought gusty winds, knocking down some trees near Priest River and Bovill in the Idaho Panhandle.

November saw a somewhat early start to the snow season. A series of storms moved through the area in the first few days, initially bringing heavy rain and then the first low-land snow to many locations. The Panhandle and Cascade mountains picked up over an inch of rain on the 2nd. Strong winds moved in behind the initial cold front, with a gust to 55 mph at Pullman and 49 mph at Spokane Airport. Lowland snow fell on the morning of the 5th. Spokane received 1.9" of snow, Republic picked up 1.6", and Mazama received 1.5". More stormy weather moved in on the 8th, with valley rain and heavy mountain snow. Another cold system arrived on the 15th for more low-elevation snow. In the Panhandle, Moscow picked up 4.5", Laclede had 6.5", Clark Fork received 5", and Bonners Ferry got 4". But by the 18th, a warmer storm brought rain to the valleys, melting away much of the low land snow. After this a very large area of high pressure developed over the western U.S. This brought ten days of dry sunny weather to Inland Northwest. But the nights were very cold, with low temperatures in the teens.

If one word could represent the weather for **December**, it would be dry. The dry weather was a result of a strong ridge of high pressure which formed off the coast by the second day of the month and generally remained fixed there until the end of the year. A few weak disturbances were able to temporarily disrupt the control of the ridge, however from a precipitation standpoint; this was the driest December on record for a few locations and in the top 10 for most. The driest conditions were found over the western Columbia Basin and near the Cascades. Ephrata only received .02" of precipitation for the month, while Omak saw .11". Both values shattered the previously set records. These reports are extraordinarily meager considering December is typically the wettest

month for most locations in the Inland Northwest. The other highlight for the month was the intrusion of some very cold air which arrived via northwest Canada. The month began on a warm note with widespread high temperatures in the 40s to middle 50s, but this warmth was abruptly curtailed by a strong arctic cold front. Initially the front brought moderate rain and some pockets of snow most of which either fell near the Cascade Crest or over the Idaho Panhandle. 1.38" of rain was reported in Cabinet Gorge, ID on the 2nd with 1.20" falling over Kamiah. Meanwhile, where it was cold enough, snow occurred. Most of the snow either fell over extreme eastern Washington or over the Idaho Panhandle. The heaviest snow amounts were 6.0 inches near Prichard. Idaho to around 5 inches in Field Springs State Park (in extreme SE Washington) and Newport, WA. Snow also fell over much of the Palouse and Columbia Basin. Once the front departed, the skies cleared and the temperatures plummeted. This set the stage for the coldest weather the area had seen since January 2011. Between the 3th and 8th, the Pullman area saw below zero readings each day. That streak of six days was the second longest on record and the most since 1974. The coldest readings occurred on the 7th and 8th with Pullman seeing low temperatures of -10° and -11°F respectively. Record lows were also set in Wilbur, Lewiston, and Moses Lake. Temperatures began to moderate by the 10th and continued to warm through the 17th as northwest flow ahead of the ridge weakened. Despite the warming the weather was generally dry. Between the 20th and 23rd a couple weak weather systems moved through the area. Although widespread precipitation occurred, most reports were light and occurred over the eastern third of Washington and the Idaho Panhandle. Both Rosalia and LaCrosse Washington reported around 5" of snow on the 21st. The weather for the remainder of the month was generally dry with near normal or slightly warmer than normal temperatures.

Site: Wenatchee, WA (Water Plant)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG
Average High Temp	32.5	47.5	55.9	63.8	73.2	78.3	92.8	87.3	79.7	63.3	47.7	35.3	63.1
Dep from Normal	-3.4	+4.1	+0.8	-0.4	+0.2	-1.5	+4.6	-0.3	+1.4	-0.2	+1.2	+0.5	+0.6

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG
Average Low Temp	24.2	28.3	32.9	41.0	50.7	56.8	64.9	63.3	56.2	40.6	33.4	24.3	43.1
Dep from Normal	-1.2	+0.6	-1.4	+0.3	+1.9	+1.2	+3.4	+2.8	+4.5	-0.6	+1.2	-0.9	+1.0

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
Precipitation	.36	.04	.83	.77	1.27	.86	.01	.59	.68	.14	.47	.19	6.21
Dep from Normal	97	96	+.22	+.24	+.58	+.20	33	+.40	+.38	52	91	-1.34	-3.01

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
Snowfall	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Tr	1.3
Dep from Normal	-2.7	-2.7	-0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-1.9	-6.7	-14.4

Site: Lewiston, ID

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG
Average High Temp	39.5	48.8	57.5	61.3	74.9	80.2	95.4	92.3	79.2	61.0	45.3	37.5	64.4
Dep from Normal	-2.1	+2.3	+2.6	-1.0	+4.0	+1.7	+6.1	+3.5	+1.0	-1.6	-2.9	-2.0	+0.9

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG
Average Low Temp	27.3	32.9	36.5	39.2	47.8	54.3	61.8	62.1	56.8	37.3	31.7	23.9	42.6
Dep from Normal	_2.3	+2.0	+0.9	+1.1	+0.8	+0.9	+2.2	+2.9	+5.8	-3.8	-2.4	-4.1	+0.1

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
Precipitation	.90	.68	.27	1.16	.84	1.93	.09	.50	1.57	.09	.71	.73	9.49
Dep from Normal	18	10	88	16	77	+.69	57	19	+.90	87	47	24	-2.82

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
Snowfall	2.3	Tr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Tr	2.5	4.8
Dep from Normal	-0.1	-2.1	-0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-1.8	-1.0	-5.7

Site: Spokane, WA

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ	NOV	DEC	AVG
Average High Temp		39.8	50.4	56.3	68.8	72.7	88.2	85.0	73.5	56.4	41.2	31.3	57.8
Dep from Normal	-3.6	+0.2	+1.5	-0.9	+2.4	-1.1	+4.9	+2.1	+0.6	-1.6	-0.4	-0.9	-0.3

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG
Average Low Temp	18.6	27.7	32.0	35.8	45.5	50.7	59.7	59.4	52.6	35.0	28.4	20.1	38.8
Dep from Normal	-6.1	+1.3	+0.4	-1.0	+1.7	+0.3	+3.4	+3.6	+5.2	-2.2	-1.4	-2.4	+0.8

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
Precipitation	1.63	.74	.82	.94	.80	1.86	Tr	0.68	1.56	.09	1.56	.68	11.36
Dep from Normal	16	59	79	34	82	+.61	64	+.09	+.89	-1.09	74	-1.62	-4.89

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
Snowfall	14.2	4.4	0.9	Tr	0.0	0.0	0.0	0.0	0.0	Tr	3.1	3.7	26.3
Dep from Normal	+2.8	-2.4	-2.6	-1.0	-0.1	0.0	0.0	0.0	0.0	-0.1	-4.3	-10.9	-18.6